

*As more people look towards surgical alternatives, which therapeutic needling treatment is more effective: dry needling or acupuncture?*

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**Abstract**

Medicine is responsible for sustaining the well-being of all forms of life on earth, and surgical procedure has always been dominant in the medical community. Recently it has been shown that surgery is losing popularity, and patients are turning towards alternative practices of opposing ideologies like dry needling (Western medicine) and acupuncture (traditional Chinese medicine). In this paper, I am comparing the two needling therapies to discover, ultimately, which is more efficacious and has a brighter future in practice and research. The research used in my paper draws mostly from randomized controlled trials regarding specific injuries around the body and the presence of placebo within both practices. Through analyzation of the research, dry needling is proven more efficacious in every study presented. It is better than acupuncture in decreasing myofascial pain, and is distinguishable from placebo, unlike acupuncture. The research indicates that patients seeking surgical alternatives should look towards dry needling treatment rather than acupuncture treatment, however, more research is needed to completely solidify the claim.

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## Part 1: Introduction

All things must evolve over time, and the evolution of medicine seems a more relevant topic than ever, especially given that the wellbeing of humans rests on much of its practices. With origins that date back before the common era, traditional Chinese medicine, according to *Shen-nong Limited*, “Is the third oldest form of medicine. Only Egyptian and Babylonian medicine predate it.” (Nong) However, as time went on, some practitioners steered away from the medical ideologies that had existed within their communities and began to focus their craft on specific forms of healing. This specificity is now correlated to what we know as Western medicine and is consistently pushing the holistic ideologies still held by the practitioners of traditional Chinese medicine. This plays out perfectly on a smaller scale between two practices that have evolved in much the same way as the ideologies that back them. Acupuncture has been in practice almost as long as traditional Chinese medicine itself, however in recent years, it began to deviate into the practice of dry needling. Dry needling superficially looks similar to acupuncture, yet focuses its needling on myofascial (muscular) pain. This is in contrast to acupuncture which targets areas of the body seemingly unassociated to the injured area - sticking with the truths of traditional Chinese medicine.

A separate form of Western medicine, orthopedic surgery, has dominated the medical community for years, with seemingly high rates of success in pain reduction among patients. In recent years, however, it has been found that surgery is declining in popularity. A systematic review of literature conducted by “Pain Medicine”, which analyzed placebo orthopedic surgery - fake orthopedic surgery that leads participants to believe it was real - found that “Placebo surgery has shown to be just as effective as actual surgery in reducing pain and disability” (Louw

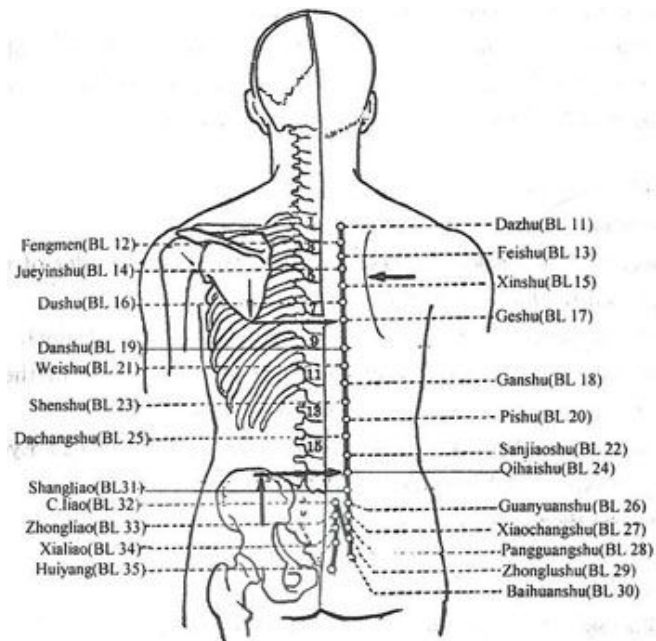
1) A contrasting study conducted by the “Department of Orthopedics at the Second Military Medical University in Shanghai” concluded that, after conducting a meta-analysis in relation to surgical and nonsurgical intervention on chronic lower back pain, “According to the present meta-analysis, improvement in [pain testing] score, and number of patients who were better after treatment were significantly better in the nonsurgical group than in the surgical group.” (Ibrahim) Seeing as the *American College of Surgeons* reported that, “Americans undergo an average of 9.2 surgical procedures per lifetime” (Lee) and the popularity of surgery is declining, alternative practices like acupuncture and dry needling are leading the way in relevancy and evaluating their efficacy is more important than ever. Through testing the efficacy of dry needling in comparison to acupuncture, data shows that dry needling is consistently more effective in reducing overall pain.

## **Part 2: Historical Context**

The meta-analysis between surgical intervention and alternative intervention in relation to chronic lower back pain showed that alternative medicine can produce a more significant reduction in pain. However, with the many options to choose from only two practices of opposing ideologies are contenders in taking the place of surgical procedures.

Historically, acupuncture started as a religious practice to rid an individual of the negative and even ‘evil’ qi, or energy. As it developed, it inherited the four main components of the traditional Chinese medicine diagnosing process - inspection, visual examination, auscultation-olfaction, and inquiry. Using these tools, the practice was honed until it could be taught on a mass scale with references to draw from. The now common practice of acupuncture

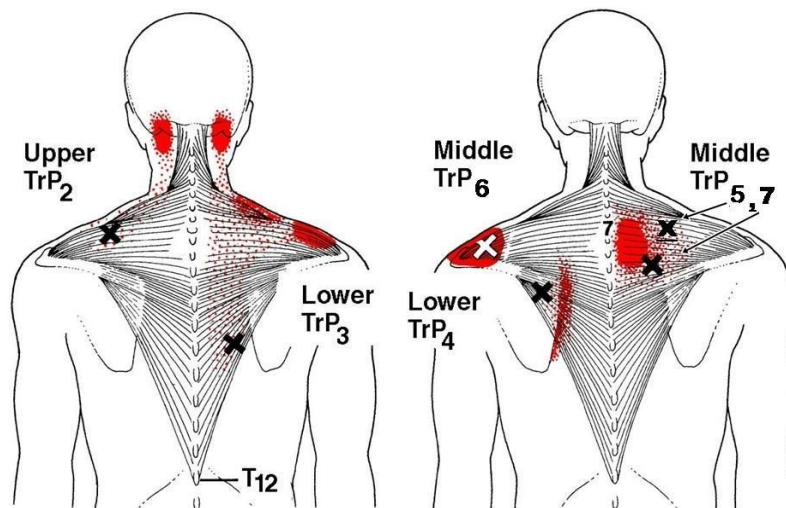
is used to shift a person's unique "climate" - The way energy flows in their body. It can moisten, dry, cool, warm, augment, deplete, redirect, reorganize, unblock, stabilize, raise, or lower a person's nerve's weather patterns or their nerve's energy. Fine needles are inserted into precisely defined points on the body, known as trigger points, to correct disruptions in harmony or the flow of energy. An individual's climate, their nervous system's weather patterns, and their body's harmony are the fundamentals of qi. The following diagram shows a small subgroup of qi points used in treating bladder pain and disease (Urinary Bladder Meridian Index):



*Figure 1: Urinary trigger points for acupuncture*

As the practice evolved and solidified, a subset of practitioners took it in a different direction. The subset of practitioners who made this deviation were the creators of what is now called dry needling.

Dry needling was originally developed in the early 1940s by medical doctors Janet Travell and David Simons who proposed injections into myofascial trigger points (hyperirritable spots in muscle). It was first used as a means to inject liquids into muscles, with the intent of healing the muscles through various medicinal substances. However, it was proposed that the needle itself could be used to puncture the skin and target the point of pain. The practice now involves the insertion of the needle into what physical therapists refer to as myofascial trigger points or specific muscular regions that are sources of pain. The following diagram shows common trigger points in treating myofascial trapezius - upper back and shoulder - pain (Manual Physical Therapy Experts, Precision in Dry Needling, Concierge Physical Therapy, Manipulation):



*Figure 2: Trapezius trigger points for dry needling*

Dry-needling of these myofascial trigger points causes an analgesic effect. This stimulation of the area via the needle causes a local twitch response which can actively ‘reset’ the muscle.

Research has concluded that dry needling can also be extremely effective when paired with electric stimulation, which can act as a catalyst in causing the twitch of the muscle.

From an acupuncturists standpoint, this newer form of therapeutic needling which is now recognized by the Western medical community crosses boundaries and is said to be insulting to acupuncture itself. Acupuncturists have argued that physical therapists, who are currently the sole practitioners of dry needling, lack the required training because they only need hours of training before becoming certified to practice. Acupuncturists train for three years in graduate programs specified for the practice. This short training process of physical therapists is believed to be throwing aside a part of acupuncture that helps to make it more efficacious, and that their holistic approach is as much important as the needling itself. Acupuncturists believe, ultimately, that the practice with no relation to the qi of the body is a flawed practice. Because of the backlash they have received from the acupuncturist community, physical therapists make the argument that their training is sufficient enough to provide their patient with the intended result - a decrease in pain and an improvement in functionality. Physical therapists argue that the practice itself is important to the healing, but also that their adaptation of the practice - which incorporates an analytical and systematic perspective fundamental to the Western medical community - is what truly solidifies its relevance. This shows where, as it currently stands, dry needling is constantly being proven efficacious by a constant stream of emerging studies that compare it to surgery, non-treatment, placebo, and acupuncture.

### Part 3: Research and Analysis

#### *Section A: Dry Needling and Acupuncture in Treating CLBP*

Chronic lower back pain (CLBP) is one of the most debilitating injuries that humans can experience and, according to the *Global Burden of Disease*, is credited as “the single leading cause of disability worldwide.” (Hoy) It has already been established that surgery is less effective in curing CLBP, however, the question must now be which practice is more successful in curing it: dry needling or acupuncture?

Lower back pain is usually myofascial - related to muscle tension, tearing, or spasming - and when it persists over a time period of three months it becomes chronic. There is no meta-analysis available on dry needling at the current time, given its recent gain in popularity. Instead, data is pulled from smaller control and study analysis. In one such study, conducted by the “Journal of Physical Therapy Science”, a team of researchers and physical therapists, “compared the effectiveness of dry needling with a classical physiotherapy program in patients with chronic low-back pain caused by lumbar disc hernia (LHNP).” (Tüzün 1) They used, in total, 34 subjects that were:

... allocated randomly to the study (18 patients) and control groups (16 patients).

In the study group, dry needling was applied using acupuncture needles. The control group performed a home exercise program in addition to hot pack and ultrasound applications. Pain was assessed with the short form of the McGill Pain Questionnaire (MPQ) ranging on a scale of 0 to 15. 15 being excruciating pain, 0 being no pain. (1)



This specific control was used for the study to highlight how effective dry needling is in comparison to the other therapies applied by physical therapists. The study group targeted trigger points in muscles with connections to major functions of the lower back, including rotation and stability. The researchers and physical therapists, throughout the duration of the study, used needles on the gluteus medius, quadratus lumborum, multifidus, and erector spinae muscles. In concluding the study, the “Journal of Physical Therapy and Science” stated that, “The results of this study showed that a program composed of [dry needling plus electric stimulation modality] was vastly superior to a common physical therapy program for treatment of low-back pain as measured by pain level.” (4) It was calculated that the study group’s pretreatment MPQ scores were  $7.1 \pm 3.4$ , in comparison to the control groups scores of  $7.8 \pm 4.0$ . The study group’s post-treatment scores were  $0.6 \pm 0.9$ , in comparison to the control group’s post-treatment scores of  $3.8 \pm 1.0$ . The decrease in MPQ scores for the study group, according to the team of researchers and physical therapists involved in the study, was “significant” (5).

Seeing as acupuncture has been in practice much longer than dry needling, there are multiple meta-analyses available on CLBP, but the largest and most current analysis covers studies conducted within the last 10 years. To begin their meta-analysis, a team of researchers with the “Journal of Orthopaedic Surgery and Research” first conducted, “A comprehensive systematic literature search through Medline using Ovid and Medical Subject Headings for randomized controlled trials published in the last 10 years. The outcomes scored were subjective pain scores and functional outcome scores.” (Hutchinson 1) The scored outcomes are the same as those used in the section on dry needling, where the MPQ and VAS (visual analog scale) are the two most common scored outcomes, using a 0 to 10 pain scale - 0 being no pain and 10 being

excruciating pain. The team of researchers were able to find, “Eighty-two randomized studies, of which [only] 7 met our inclusion criteria.” (1) Of the 7 studies, three were testing acupuncture and sham acupuncture in comparison to no treatment. Sham acupuncture is a form of placebo in which patients are lead to believe they are being practiced on but are not actually, where their belief ultimately affects the pain they are feeling instead of the actual practice. In these three studies testing acupuncture and sham acupuncture in comparison to no treatment, it was found that there was a, “slight difference in pain scores when comparing acupuncture, or sham acupuncture, with conventional therapy or no care.” (2) Two studies were testing specifically acupuncture treatment in comparison to no treatment, and found that there was a “significant difference between acupuncture treatment and no treatment or routine care at 8 weeks and 3 months.” (2) Finally, three studies compared acupuncture to sham acupuncture, although this comparison will be addressed later in the thesis. After analyzing the seven sets of data, it was concluded by the authors of the paper that, “This review provides some evidence to support acupuncture is more effective than no treatment but no conclusions can be drawn about its effectiveness over other treatment modalities as the evidence is conflicting.” (7)

Based on the contradicting studies, and only slight changes in VAS scores between acupuncture and conventional care, the evidence seems to point towards dry needling as the more efficacious practice in this specific scenario. Based on the comparison between the study of dry needling and the meta-analysis of acupuncture, dry needling gives patients more significant pain reduction. There is no conflict between the results of the dry needling study, although the acupuncture studies show little agreement. Acupuncture has some success when it is compared to no treatment, yet nothing can be set as certain given that it is unknown how much of a role

placebo plays into making that determination. Within the meta-analysis was little to no difference between sham acupuncture and regular acupuncture, which is an important contrast that, as stated before, will be looked at more in depth later in the thesis. In relation to CLBP, it is currently shown that dry needling is more effective in improving functionality and decreasing pain.

### *Section B: Dry Needling and Acupuncture in Treating Adhesive Capsulitis*

Adhesive capsulitis, more commonly known as frozen shoulder, is a common injury that causes a near complete disability of function within the shoulder. Adhesive capsulitis is caused by the adhesions in the shoulder joint and inflammation of the capsule of the humerus, the ‘socket’ of the shoulder ‘ball and socket’. Frozen shoulders can be operated on, but the invasiveness of the surgery causes many to seek alternative treatment. Once again, dry needling and acupuncture are top contenders for efficacious alternative therapies.

In order to test the efficacy of dry needling in relation to adhesive capsulitis, researchers with the “Journal of Orthopaedic & Sports Physical Therapy” tested an individual patient in a case study and recorded the events and outcomes of 13 sessions of dry needling and mobility testing. In their case description, the researchers state that:

Although manual techniques seemed to result in some early functional improvement, continued progression was limited by pain. Subsequent examination identified trigger points in the upper trapezius, levator scapula, deltoid, and infraspinatus muscles, which were treated with dry needling to decrease pain and allow for higher grades of manual intervention. (Clewley 1)

The team was testing this individual's decrease in pain, using the scoring methods in the previous section - VAS and MPQ - while also testing the functional aspect of the shoulder. They focused specifically on range of motion (ROM), including internal and external rotation, abduction, and flexion of the shoulder. After the patient's 13 sessions it was stated that:

After trigger point dry needling was introduced on the third visit, improvements in pain-free shoulder range of motion and functional outcome measures, assessed with the Shoulder Pain and Disability Index and the shortened form of the Disabilities of the Arm, Shoulder and Hand questionnaire, exceeded the minimal clinically important difference after 2 treatment sessions. At discharge, the patient had achieved significant improvements in shoulder range of motion in all planes, and outcome measures were significantly improved. (6)

The patient's ROM was measured using a goniometer and saw an average increase in motion of 70 degrees by their discharge. The VAS scale measured from 0 to 10 and by the discharge session, it was recorded that the patient finished with a score of 0 where they had started with a score of 7.

The study conducted for testing the efficacy of acupuncture in healing adhesive capsulitis measured its outcomes with ROM and a VAS pain scale. In this study, researchers with "Materia Socio-Medica" analyzed a total of 40 people, splitting them into two groups where, "Patients were divided randomly into 2 groups with 20 members in each group; in the control group, physiotherapy and in the case group, acupuncture was used in addition to physiotherapy." (Asheghan 2) The researchers recorded active and passive ROM in, "three intervals: before treatment, 1.5 months into treatment, and finally 3 months into treatment." (4) It was after

pooling the data for all ROM tests that the researchers determined that, “generally, acupuncture causes improvement of all movements of the shoulder, but about flexion and abduction the improvement was evaluated to be more.” (5) It was also noted that there was, “improvement of the VAS scale over the course of the three month treatment period.” (5)

The important contrast comes from the significance of the improvements of ROM and VAS testing in comparison to the tests conducted for dry needling. On average, the increase of overall ROM over the three month period was 50 degrees, compared to dry needling’s 70 degrees. In regards to acupuncture, the pretreatment VAS measurements were scored at  $8\pm 1$ , and the post-treatment scores were recorded at  $3.3\pm 1$ . However, in comparison to the dry needling case study - which saw a scored decline from 7 to 0 - dry needling is shown to be more efficacious. In relation to adhesive capsulitis, both dry needling and acupuncture show their efficacy, however with the information at hand dry needling is more efficacious. That being said, the comparison is limited due to the single study conducted for dry needling. For the claim to be further solidified, a larger dry needling study must be run and compared once again to the acupuncture study. The sample size would need to be larger than a single patient, although as time goes on the pool of studies to choose from will assuredly grow.

### *Section C: Dry Needling and Acupuncture in Relation to Placebo*

Placebo plays an important role in medicine across the board, but is often considered to be temporary. As defined by *MedicineNet*, placebo is:

A remarkable phenomenon in which a placebo - a fake treatment, an inactive substance like sugar, distilled water, or saline solution - can sometimes improve a

patient's condition simply because the person has the expectation that it will be helpful. The more a person believes they are going to benefit from a treatment, the more likely it is that they will experience a benefit. (Definition of Placebo Effect)

Placebo has its short term benefits, but a treatment can only be proven truly efficacious if it is more successful than placebo, or the gap between their outcomes is clearly distinguishable.

A study conducted by the “Department of Physical Medicine and Rehabilitation at the Gulhane Military Medical Academy” analyzed the effects of dry needling and sham (placebo) dry needling in regards to alleviating myofascial pain. The researchers involved in the study used, “a prospective, double-blinded, randomized-controlled study conducted in an outpatient clinic. Thirty-nine subjects with established myofascial trigger points were randomized into two groups: study group and placebo group. Dry needling was applied using acupuncture needles, and sham dry needling was applied in the placebo group.” (Tekin 1) Using the VAS scoring method, the researchers took 6 polls, 1 poll a session for 6 sessions, from the 39 patients involved. It was recorded in the results section of the analysis that, “When VAS scores were compared between the groups, the first assessment scores were found to be similar, but the second and third assessment scores were found to be significantly lower in the dry needling group” (4) The patients of the clinic were also submitted to taking the SF-36 outcome measurement test, which scores similarly to the VAS but instead measures the physical (functional) and mental health of patients. Through answering questions and self-analyzation, patients mark how they move and feel. The study stated that, “When SF-36 scores of the groups were compared, both the physical and mental component scores were found to be significantly increased in the dry needling group.” (5) In the discussion section of the study, the researchers

analyzed the data and came to the ultimate conclusion that, “The present study shows that the dry needling treatment is [more] effective in relieving the pain and in improving the quality of life of patients with [myofascial pain].” (5)

Furthermore, the study focusing on acupuncture, which was conducted with the “Nordic Cochrane Center”, compared acupuncture with sham (placebo) acupuncture and then both with no treatment. The objective of this meta-analysis, which extracted data from several three-armed randomized clinical trials, was to, “Study the analgesic effect of acupuncture and placebo acupuncture and to explore to what extent placebo acupuncture is associated with the estimated effect of acupuncture.” (Madsen 1) In three studies that were analyzed, all were related to myofascial pain and each study used a separate pain outcome measurement tool including VAS. The researchers took the standard deviation of the pain scales for both sham and actual acupuncture and created a table in which to compare the two. Upon analyzation, it was concluded that there was a, “Small difference between acupuncture and placebo acupuncture and a moderate difference between placebo acupuncture and no acupuncture. The effect of placebo acupuncture varied considerably.” (6) The analgesic, or pain relieving, effect of acupuncture and placebo acupuncture was virtually indistinguishable, and researchers even considered identifying the sham acupuncture as a “super placebo” (8) although later decided against it as the effects of placebo ranged differently.

Upon a final comparison of the two, it can be clearly determined that dry needling holds a significant separation between its placebo counterpart and that there is more than just belief that plays a role in pain reduction. It is not surprising that the placebo acupuncture reduced patient’s pain more when compared to no treatment. Actual acupuncture, however, showed little

difference in pain reduction overall when being compared to the sham acupuncture. This gives rise to the belief that the effects of acupuncture, in general, are placebo, and it cannot be confirmed that actual acupuncture is any more effective than placebo acupuncture.

#### **Part 4: Conclusion**

With studies proving the efficacy of dry needling in regards to two common injuries, and a study that shows dry needling's effects extend beyond placebo, the present data clearly shows that dry needling is consistently more effective in reducing overall pain. It is certainly true that acupuncture's focus is not wholly on myofascial pain, but there is no doubt that myofascial pain is one of the leading causes for individuals seeking treatment. The current data on dry needling shows both its ability to effectively decrease myofascial pain, but also opens the door for future investigation into its efficacy concerning non-myofascial related injuries.

The placebo effect enhances all medical treatment and is valuable in its own regard. For long-term relief and functionality, however, the distinguishability between dry needling and sham dry needling is shown to be much more than coincidence: it is proof that dry needling works, and works well. It is not to say that placebo in acupuncture is not effective, however there is little distinguishability between real and sham acupuncture. Those who seek acupuncture and believe it will work will see results, but how successful will those results be? More importantly, what is the scale of their results in comparison to the results found if they were to seek dry needling treatment? If a patient is wanting to maximize results in decreasing myofascial pain in their injured region, dry needling is certainly the superior option.



With the proven potential of dry needling, it is now important to look at the practice's future as an instructive case study for Western and traditional Chinese medicine (TCM). Dry needling is a perfect example of the integrative medicine that combines TCM practices with Western medical ideologies. The practice of dry needling is originally TCM-based, however it has been combined with evidence-based controlled trials which stem from Western medicine. There is a reason why TCM has lasted as long as it has, but with its new competitor both ideologies can learn from one another. The two biggest outcomes in the multitude of studies applied in this thesis are that, one, the analytical and numerical approaches taken by Western medicine are paramount, and two, that TCM practices like acupuncture are a strong foundation for Western ideologies to build upon. Dry needling, when used by physical therapists, combines an analytical practice which has been Westernized, with a practitioner that is trained to connect with the patient. This is integrative medicine at its core, and it works rapidly and effectively. Dry needling itself also has a bright future. In an article posted to *iDryNeedle*, physical therapist Paul Killoren listed his predictions for the future of dry needling where he included that, "More physicians will implement dry needling, dry needling will be used with neuro and oncology patient populations, and dry needling-specific products will boom." (Killoren) Given that dry needling's clinical potential is through the roof, it seems certain that healthcare practitioners will take notice. As it begins to pick up in physician popularity, so will it in product popularity. Major medical product manufacturers will act quickly in developing dry needling-specific products to help increase its ease of use. As for its overall medical potential, while lack of clinical evidence still restrains it to just myofascial pain, studies will continue to emerge that test it against other ailments. The neurological and oncological areas of medicine are booming and it seems fitting

that dry needling will be put to the test in terms of pain relief and functional improvement. As it stands with physical therapists and researchers from all facets of medicine, dry needling has a bright future.

With a future that is progressive and shows growth and a past that proves its efficacy, dry needling is more effective and further evolved than acupuncture. Western and traditional Chinese medicine stand at a precipice, and though they are prolonging the jump, there will come a time that both will collide to create a form of integrative medicine parallel to that which dry needling embodies. Time will tell what other influences TCM practice could have on Western ideologies. It can, however, be established that as the continual evolution of medicine occurs, so will the combination of practice and idea.

## Works Cited

- Asheghan, Mahsa, et al. "INVESTIGATION OF THE EFFECTIVENESS OF ACUPUNCTURE IN THE TREATMENT OF FROZEN SHOULDER." *Materia Socio-Medica*, AVICENA, D.o.o., Sarajevo, 24 July 2016, [www.ncbi.nlm.nih.gov/pmc/articles/PMC5034968/](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC5034968/).
- Clewley, Derek, et al. "Trigger Point Dry Needling as an Adjunct Treatment for a Patient With Adhesive Capsulitis of the Shoulder." *Journal of Orthopaedic & Sports Physical Therapy*, Movement Science Media, 25 Oct. 2015, [www.jospt.org/doi/abs/10.2519/jospt.2014.4915](http://www.jospt.org/doi/abs/10.2519/jospt.2014.4915).
- Hoy, Damian, et al. "The Global Burden of Low Back Pain: Estimates from the Global Burden of Disease 2010 Study." *Annals of the Rheumatic Diseases*, BMJ Publishing Group Ltd, 1 June 2014, [ard.bmj.com/content/73/6/968](http://ard.bmj.com/content/73/6/968).
- Hutchinson, Amanda J P, et al. "The Effectiveness of Acupuncture in Treating Chronic Non-Specific Low Back Pain: a Systematic Review of the Literature." *Journal of Orthopaedic Surgery and Research*, BioMed Central, 30 Oct. 2012, [josr-online.biomedcentral.com/articles/10.1186/1749-799X-7-36](http://josr-online.biomedcentral.com/articles/10.1186/1749-799X-7-36).
- Ibrahim, T., I. M. Tleyjeh, and O. Gabbar. "Surgical versus Non-Surgical Treatment of Chronic Low Back Pain: A Meta-Analysis of Randomised Trials." *International Orthopaedics* 32.1 (2008): 107–113. *PMC*. Web. 13 Feb. 2018.
- Killoren, Paul. "WHAT'S NEXT FOR DRY NEEDLING?" *IDryNeedle*, IDryNeedle, 27 Jan. 2016, [idryneedle.com/blog/whats-next-for-dry-needling](http://idryneedle.com/blog/whats-next-for-dry-needling)

Lee, Peter, et al. "How Many Surgical Procedures Will Americans Experience in an Average Lifetime?: Evidence from Three States." *MCACS: How Many Surgical Procedures Will Americans Experience in an Average Lifetime?: Evidence from Three States*, 2 May 2016, [www.mcacs.org/abstracts/2008/P15.cgi](http://www.mcacs.org/abstracts/2008/P15.cgi).

Louw, Adriaan, et al. "Sham Surgery in Orthopedics: A Systematic Review of the Literature." *Pain Medicine*, Oxford Academic, 24 Apr. 2017, [academic.oup.com/painmedicine/article-abstract/18/4/736/2924731?redirectedFrom=fulltext](http://academic.oup.com/painmedicine/article-abstract/18/4/736/2924731?redirectedFrom=fulltext).

Madsen, MV, et al. "Acupuncture Treatment for Pain: Systematic Review of Randomised Clinical Trials with Acupuncture, Placebo Acupuncture, and No Acupuncture Groups." *The BMJ*, Nordic Cochrane Center, 28 Jan. 2009, [www.ncbi.nlm.nih.gov/pubmed/19174438](http://www.ncbi.nlm.nih.gov/pubmed/19174438).

"Manual Physical Therapy Experts, Precision in Dry Needling, Concierge Physical Therapy, Manipulation." *Bluegrass Doctors Of Physical Therapy, PLLC*, 20 Jan. 2015, [www.bluegrassdoctorspt.com/apps/blog/show/43027848-upper-trapezius-and-its-referral-sources-](http://www.bluegrassdoctorspt.com/apps/blog/show/43027848-upper-trapezius-and-its-referral-sources-).

Net, Medicine. "Definition of Placebo Effect." *MedicineNet*, WebMD, [www.medicinenet.com/script/main/art.asp?articlekey=31481](http://www.medicinenet.com/script/main/art.asp?articlekey=31481).

Nong, Shen. "TCM History." *Shen Nong*, Integrated Chinese Medicine Holdings, 23 June 2010, [www.shen-nong.com/eng/history/introduction.html](http://www.shen-nong.com/eng/history/introduction.html).

Tekin, L, et al. “The Effect of Dry Needling in the Treatment of Myofascial Pain Syndrome: a Randomized Double-Blinded Placebo-Controlled Trial.” *Clinical Rheumatology*, U.S. National Library of Medicine, Mar. 2013, [www.ncbi.nlm.nih.gov/pubmed/23138883](http://www.ncbi.nlm.nih.gov/pubmed/23138883).

Tüzün, Emİne Handan, et al. “Effectiveness of Dry Needling versus a Classical Physiotherapy Program in Patients with Chronic Low-Back Pain: a Single-Blind, Randomized, Controlled Trial.” *Journal of Physical Therapy Science*, The Society of Physical Therapy Science, 15 Sept. 2017, [www.ncbi.nlm.nih.gov/pmc/articles/PMC5599809/](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC5599809/).

“Urinary Bladder Meridian Index.” *Acupuncture.Com - Acupuncture Points - Urinary Bladder Meridian (Channel)*, Cyber Legend, 12 Mar. 2014, [www.acupuncture.com/education/points/urinarybladder/ub\\_index.htm](http://www.acupuncture.com/education/points/urinarybladder/ub_index.htm).